

AN  
ESSAY  
FOR A  
MACHINE  
OF  
Perpetual Motion.

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By Mr. ROBERT STEWART, *Minister of the Gospel.*

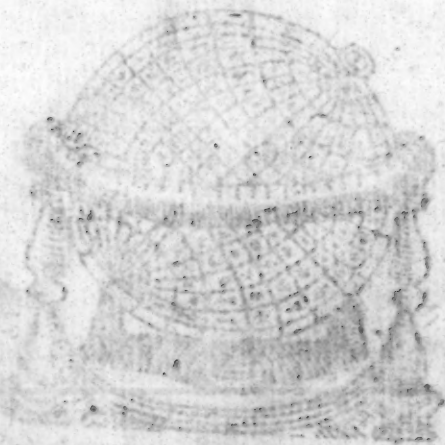
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EDINBURGH,  
Printed by, *James Watson* in *Craig's Close.* 1709.

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EDINBURGH:  
Printed by James Watson in Craig's Close. 1799.



To the Right Honourable and Truly Noble JOHN  
Earl of Braedatbin, Viscount of Tay and Pittland,  
Lord Glenurchy, Benderloch, Ormely, and Wick, and  
Heretable Sheriff of Caithness, &c.

MY LORD,

**G**ratitudo obliges me, to Dedicate this small Essay to your Lordship  
as its Patron; which, if your Lordship had not Countenanced, it  
might have unluckily Perished: whereas now it seems to defy all  
its Adversaries, and appeals to one of the most Learned Societies in the  
World, the Royal Society at London; whose Examination, if it sustain  
so irresistibly, as it has done that of others here, it may be happily Prosecu-  
ted, as it was by your Lordship designed; that is, either Repelled pro toto  
or tanto, or generously Encouraged according to the Merite of the De-  
sign; and it is Justice, if there be any thing about it that may oblige  
the Learned World, they may know to whom it is owing; for as the  
Genoese and English wisht they had encouraged Christopher Colum-  
bus, for then America had been their own: So there is no doubt, if  
the Design take effect pro tanto, or toto, your Lordship shall have  
as many to contribute towards it, as America found Men ready to In-  
habite, who did not Christopher the Honour or Justice, of giving  
him the Name of the New found Land, but gave it to Americus  
Vesputius, which shall not be so here. This all the Complement I can  
confer upon your Lordship, Grateful Expressions in Words and Actions,  
which the Idea I have of your Lordship's Intrinsic Personal Vertues,  
likewise obliges me to. I know your Lordship to be the Honourable  
Father of an old Family that vies Antiquitie, Honour, Power,  
Splendor, Riches, Fame, Pleasures, Inheritances and Freedom with  
any of the Neighbouring Grandees; which Complex Dignity, God and  
Nature has Crowned with Old Age and Gray Hairs: By which Ensigns  
of Honour it may appear, how the Divine Nature is disposed to make  
your Latter-End Peace: All which Happiness has not inclin'd you to  
the least degree of Self-conceitedness, or boasting of your Antiquities,  
seeking to be truly Great without Ambition, Powerful without being  
Ter-

Terrible to your Inferiors, but a great Support; Wise, not affecting  
Admiration; Rich, without Covetousness or Envy; Amiable, shun-  
ning to be the Subject or Object of Malice: of both which, you  
have given equal Demonstrations, in forgiving of Injuries: As also,  
in doing the greatest Favours to your Neighbours and Friends;  
particularly, that Family I am come off, which I hereby de-  
sign should never be forgot, just to such a degree, that the Matters  
of the greatest Difference and Importance have been adjusted by  
your Mediation, as the Clans of the Highlands will Attest, not  
only with respect to their Private, but their National Concerns; for  
whose Lives, Honour and Interest, you have ventured your Own, and  
had almost Sealed your Mediation with your Blood; and that with so  
much Freedom of Spirit, that Maugre Envy and Malice, the Honour  
of that Mediation is properly Yours. It is Presumption in me to De-  
scribe such a Noble Personage (for I'm neither Homer nor Cicero)  
but, what I think, I can Maintain, not only from the Experience of o-  
thers, but my own: This Idea I suggest, that Justice may be done to it,  
by your Friends and Neighbours, and that your Noble Posterity when  
they look back to you and your Predecessors, need not envy the Memoirs  
of other Families, finding in your Self a knot of all that Fineness that  
was in the former: The History of your Life being a Demonstration of  
the Conjunction of these Qualities which Adorn and make a Man Great,  
as Courage, Conduct and good Nature; so that it was the same Case  
which of the Virtues made the first Appearance in the Design or Action,  
where the one went, the other two went likewise; and what Nature  
had among many others paired, it has in Thee concerted.

My Lord, Having no design but the Truth, least I be challenged for presuming  
too much on your Lordships Modesty, and these Vertues which shine so brightly in  
you, rather than sully your Perfections with my rude Pen, I forbear: Wishing that  
as God and Nature have made you Great here, a Crown of Glory may compleat your  
Happiness hereafter, which, as I believe, is your Lordship's, Desire, Design and Hope;  
so I need not trouble my self to persuade your Lordship, that it has, is, and al-  
ways shall be the most earnest Desire of Him, who is,

My Noble Lord,  
Your Lordship's most humbly Devoted Servant,  
Robert Stewart.



capable of meditating with such a task, as they are with some  
Business, Trade and War, in which Cases the publick Con-  
science is indispensably needed, the not to have, as appears from

These Considerations have so much and so long prevailed with  
me, and bewixt these and other contraries, my Mind did so  
fluctuate, that at last I found it indispensably needful, despo-  
sally to Determine my self for the following Alternative, having  
in my View these Reasons.  
Two. By distinct Consideration, I may and I suppose am capable to  
the Laws of God and Man, I hold my self obliged to the Society

**AN  
ESSAY**

***For a Machine of Perpetual Motion.***

**A****FTER** the Experience of so many Years thinking, and as  
frequent Conferences with the Learn'd Men in this Na-  
tion skilled in such Matters, as my Occasions did offer  
me Converse with, concerning an Overture for a Ma-  
chine, so oft attempted by Societies, as well as Private Per-  
sons of the best Sense, both at Home and Abroad, tho' never yet  
finished, commonly called the **PERPETUUM MOBILE**.  
I have at length, leaning to GOD's Assistance, adven-  
tured to make my Design known, to the end, this Notional  
Embryo, which with so many thoughts I have in private conceived,  
may, by publick Encouragement, happily be advanced to these  
Degrees of Perfection it shall be found capable of, if there be any  
Life in it.

I know some may be allarm'd, why this Lifeless Essay should  
be exposed to publick View, Ridicule and Censure by such a  
daring Method, when as a little Expences and Pains in private,  
might have effectuate all that the Publick is able to do in such a  
Case, which must always remit such Designs to the Care and In-  
dustry of private Persons, pretending themselves fit for them;  
since it is not to be supposed that the Body Politick is equally

capable of meddling with such a Task, as they are with common Business, Trade and War ; in which Cases the publick Concurrence is indispensibly needful, tho not so here, as appears from the Consideration foresaid.

These Considerations have so much and so long prevailed with me, and betwixt these and their contraries, my Mind did so fluctuate, that at last I found it indispensibly needful, despotically to Determine my self for the following Alternative, having in my View these Reasons.

1<sup>mo</sup>. By instinct of Nature, Duty and Disposition, agreeable to the Laws of God and Man, I hold my self obliged to the Society (which is no less than all the World) whereof I am a Member, to do them all the Good I can ; which Reflection makes it most Dutyful, not only in Private to Attempt, but in Publick to propose whatever is presumed probably subservient to this great End, albeit the Design prove ineffectual, as *David's* Resolution for Building the Temple by restraint, *Solomon's* and *Uziah's* for Trade by Shipwrack, and *Archimedes's* intended Demonstration by Death ; especially when fine Men in a considerable Number have over-tur'd the same, which in Questions of greatest Importance is sustained as a sufficient Ground of Probability ; and why it should not pass so here, I do not comprehend, since it is well known I am not the first Undertaker.

2<sup>do</sup>. It is not to be doubted, but excellent Designs have been stifled in their beginnings ; for as narrow Pitchers cannot hold so much Earth as will suffice to bring up tall and lusty Cedars, which easily grow in curious Gardens : So private Persons are not able to finish Mighty Designs, tho' for a Season they may raise and preserve the Seeds of them ; witness, *Christopher Columbus's* Overture for *America*, the uses of the Loadstone and other Inventions which were advanced to their Perfection by the Influence of the Publick.

3<sup>tio</sup>. Great Men in their Writings have sown the Seeds of curious Operations, which never were, nor will be reduced to



**Practice**; for which their well meaning Overtures, since no Man blames them, I see no Reason why one may not offer to lay the Foundation of this Noble Machine with an equal Freedom.

4<sup>th</sup>. I am confident from my own Experience, and Example of others, that there is no Method more apt to marr a Design that is Practicable, than Concealment; for albeit Fires and Candles do resemble the Luminaries of the Heavens in their Influence, yet no wise Man will deny himself the Assistance of the Greater, and confine himself to the Lesser, that resolves to advance a Project depending on Heat and Light, to the degree of Nature's Energy: The same I judge of all those who neither requiring nor receiving Assistance from Abroad, were soon Dared to give it over with every little discouragement that ballanced their strength at Home; whereas, if the World had known their Thoughts, they happily might have been Assisted, ineffectual Repetitions prevented, less time required, or a Demonstration for the Negative extorted; for in every respect where one is conceived fit for a Design, a Society is much more *ceteris paribus*: Wherefore, since I observed that none hitherto Prosecutes this Overture with that freedom they use in all their other Projects, I adventure to clear the Stage of all Scruples that hitherto have molested my self, and all have gone before me, by asserting boldly and openly (tho' modestly) that such a Machine is in my Judgment not only Possible but Practicable, which I hope my *Probleme* will sufficiently vindicate.

5<sup>th</sup>. I know some pretend a Demonstration to the Negative, because every thing moves to the Centre of Gravity; but this does not infer that a Machine cannot be made, whose Periodical Motion shall be equal to the duration of Matter, and then it rests; I know not why there should be more in the Conclusion, for there is no more in the Premisses; yet since it is judged impracticable almost by all Men, which is the common Fate of all Inventions before Experiment; in Christian Modesty, whatsoever I think of it, I shall suspend as much as is proper, till I see my thoughts

thoughts about it put to a full Trial, but shall not precariously beg allowance in any degree of Favour, save these I shall fairly obtain according to the Rules and Laws of Staticks and Motion: All I say further is, the Brevity of our Lives, the force of my Thoughts about it, other Mens Design and Desire, and my own of reducing it to Practice, the *non plus* and stand I find Mathematicians at, in Demonstrating the Negative, determined me to try this Method, being greatly encouraged by this, that none ever before me durst present his Overtures to be Examined, or abide the Fiery Trial, as I have done, and that this Method puts me in Capacity of doing what can be done, with the fewest Inconveniencies and greatest Advantages.

6to. Some will impute my Freedom to Impudence; since Men have used Privacy: To which I answer, That to Argue Negatively from Humane Authority, is not sustained a good Argument in any Science.

Some will disdain me and my Reasons: For these I can do nothing but Pray for and pity them; for if they had been born Pagans, the disdain of a new Discovery would rivet and seal their Ignorance, and send them to the lower Hells where they'll meet with their near Relations the Devils: And this Apology I make for my Freedom, let the Event be as GOD will.

I am not a little surpriz'd with the opposition this Design meets with from Learned Men, among whom I find some of the *Royal Society* at London, whose Judgment is valued by me as the Judgment of the whole, and by being so, equivalent to the Opinion of the Learn'd World, of whom I cannot but reckon such a Fraternity one of the Noblest Swatches, whose Advantages and Advancements in Learning are so far above any, I or any private Person can pretend to; that to Oppose is terrible, to Appeal will be reckon'd Presumption; but to pass from what I think certain or probable, not like a Theologue whose Principle it is *si Deus pro nobis quis contra nos*; for in the Genealogie of Thoughts I believe GOD to be the Typograph, Man the Book, and every thing else the.



the Types and Mediums whereby GOD by an External super-  
venient *Impetus* operates on me so Framed, and creates Ideas in  
me, which if they be fixt, I reckon my self certain; if probable,  
inclines me to one side of a Proposition more than the other; if  
fluctuating I Suspend; if no Ideas be Imprinted, then I waver  
like a Ballance without Weights; in which Circumstances, since  
I find my self in relation to the present Design, as I do partly in  
all other Scientifical Projects; I easily believe I could not Ap-  
peal to a Society fitter to Emancipate and Protect me from the  
Accidents of Inconsideration, the Fluctuations of Equilibra-  
tion, the Scruples that attend Probabilities and Verisimilitudes,  
Discouragements the most fixed Truths meet with.

For my rashness in making any Motion like to a seeming Op-  
position to a Member of that learned Society, and Appeal to the  
Whole, I give these Reasons,

1<sup>mo</sup>. The weakness of my Nature, which moves according  
as I have or want Ideas; so that I hope to be Excused for my  
rashness, if I have no thought about me powerful enough to des-  
termine the ballance of my Soul to one side more than another, I  
must call it an Accidental Motion.

2<sup>do</sup>. I meet with his Opposition in this Place that has any  
weight in it, for some Disdain without Enquiring; others Enquire  
without Capacity, and Condemn for want of an Idea of my  
Scheme or Model; others, Men of the best Sense enquire, exa-  
mine, are in Love with it, amaz'd with the Force of the Demon-  
stration, can give no Reason against it, are afraid to trust their  
Thoughts, for no Motives I know but Two; the one is, the great  
value of the Design; the other is, their Modesty, referring to the  
Royal Society, or the like, whose Prerogative it is to have such  
Cases judged before, and Encouraged by them.

3<sup>tio</sup>. Others, Men of Honour and Sense, have encouraged me  
with some degree of Approbation, as some of the Nobles, Ho-  
nourable Faculty of Advocates, Royal College of Physicians, and  
Society of Writers, not doubting but these whom I have already

Ad.

Addressed, as the Right Honourable the Council of the Good Town of *Edinburgh* (on whose Board my Address lyes unanswered, not for want of Inclination, but for want of time in me to wait on them hitherto) Society of Chirurgions, &c. whom I resolve to Address, will follow their Example, when they find with what Ingenuity I endeavour to promote and finish my Design, at no less Rate than to Appeal to the *Royal Society*, whom, as I am Informed, so I think them the fittest in the World to Nourish a probable Probleme of this Importance, dying for want of Encouragement, and the reference made to their Judgments; which Honourable Prerogative, since the Learn'd World indulges them so freely and without envy, determines me as Lover of Learning, to pay in to them my proportion of Tribute, which their Triumphant Name craves and expects; and where should such a Case be Judged, but before them? And from whom should it expect Justice, but from them? I only make use of Dr. *Cheyne's* Argument as an Handle for getting my Probleme fairly Tabled before them, resolving to do them and all the World, my Overtures and my self Justice, by using this Freedom, which may (as pleases God) have one of these Effects.

1<sup>mo</sup>. To be Considered, Examined and Repelled Demonstratively *Pro toto*, or *tanto*.

2<sup>da</sup>. If not so Repelled, Encouraged *Pro toto*, or *tanto*.

For the Machine would be of such uses, Mills, Coal-works, dividing of Time, Clocks, Watches, finding out the Longitudes, that I am fully perswaded that Noble Society will not disdain to do me Justice in the Terms of my Appeal; for which ends I follow this Method.

By a *Perpetuum Mobile*, is meant a Machine, which may move Durante Materia: And according to my Judgment, it must consist of three Propositions.

1. Proposition, *A Weight always going down, never going lower.* Of this Proposition I have no nearer Simile without the Scheme, than as if a Globe suspended in the open Air, keeping always the same



same Centre, should move with propensity towards one side continually: As several Orbs do, which I demonstrate by a Scheme, & illustrate by a curious Model of Timber made at the Charges of the Noble Earl of *Braedalbine*, who Name should be made known to the Learned World for his readiness to encourage Arts and Sciences.

The 2d Proposition, is a Ballance by which an equal Weight overcomes an equal Weight, the Velocity being equal on both sides of the common Center; this ballance is not of common Form, and therefore to be described.

The 3d Proposition, is as clear an Idea of a *Perpetuum Mobile* upon the Fond of these two Propositions granted, as two and three makes five.

I take it as granted, that a Ballance being invented, by which an equal Weight preponderates an equal Weight; this Globe I mentioned before, equally dividing it self betwixt the two Extreams of this Complex Ballance, which are industriously turned about to one side of the common Center, having more power on the one side, than it has on the other side, will always roll about its own Center, and in the mean time Horizontally about the common Center, being so ordered, that it cannot roll about its own Center, without going about the common Center, as all the moveable Wheels of the Machine do, which are in the present Model twelve, which with three that are fixt makes fifteen.

I find it uneasy to Describe the Whole, I think it needless, because I have a Patern at hand to illustrate the same, which in one knot of Motion performs the Resemblance of all the Motions in the Universe, *viz.* a Centr-petal, Centrie-Fugal, Circular, Single, Double Progressive, Vertical Horizontal, Trochleal, Cochleal, Cuneal, Malleal.

I find Men of the best Sense fly in the face of the second Proposition, an equal Weight overcomes an equal Weight; but tho' I mean equality of Weights and Velocities, I do not mean equality of Powers; which Distinction is nicely to be remembered,  
and

and if I demonstrate, as I have done a thousand times, by the Rules of Motion already received, tho' it fall out, there is a greater Discovery made of the Mechanical Powers, and a Theoreme or two bettered, since we find Learning improving, I hope no Man has Reason to be offended; but on the contrar, I think it should oblige them to adore that Omniscience who can freely discover to one Age what was unknown to the former, I mean those Gentlemen with whom I have Converſed about it, because I neither find them frankly againſt me nor for me, but ſtill ſuſpending, ſmoothing my Propoſals with ſilence, and referring to the Royal Society, from whom I boldly crave Juſtice, ſince the Appeal is equal upon both ſides.

As I underſtand, it's needleſs to Inſiſt on general Arguments; yet ſince there is one pretended for the Impoſſibility, I muſt return the equivalent for its Poſſibility.

## LAW SECOND.

*The Changes made in the Motions of Human Bodies, are always proportional to the Impreſſed Moving Force, and are produced in the ſame Direction with that of the Moving Force.*

Effects are always proportionable to their adequate Cauſes, and if any degree of Force produce any degree of Motion, a double degree of the ſame Force will produce a double degree of Motion, and a triple a triple, and ſo on, and this Motion muſt proceed in the ſame Direction with that of the Moving Force; and if the Body was before in Motion, the Motion ariſing from the Impreſſed Force, if in the ſame Direction does ſo much increaſe the former Motion; if it has a contrary Direction, it deſtroyes part of the former Motion equal to that which is impreſſed: when it has a Direction oblique, it either adds to, or ſubtracts from Motion, according as the Motion ariſing from a Composition of theſe two is Determined.



( 9 )  
COROLLARY.

“ Hence it is evident, that in the present Constitution of  
“ Things there can be no perpetual Motion, I mean, an unin-  
“ terrupted Communication of the same degree of Motion from  
“ one part of Matter to another in a Circle; not as Bodies, put  
“ in Motion, do for ever move in the same; but in so far as they  
“ are resisted and stopped by other Bodies; but a Circulation of  
“ the same quantity of Motion, and that it perpetually return  
“ undiminished upon the first Mover: For by this Law, the  
“ Motion produced is but proportional to the Generating Force,  
“ and all Motions on this Globe being performed in a resisting  
“ Fluid, *viz.* the Air, a considerable quantity of the Motion, must  
“ be spent in the Communication on this Medium, and conse-  
“ quently it is impossible, the same quantity of Motion should re-  
“ turn undiminished on the first Mover, which is necessary towards  
“ a perpetual Motion: The Nature of material Organs being such,  
“ that there is no avoiding a Greater or Lesser Friction, tho’ the  
“ Machine be Formed according to the exactest Principles of  
“ Geometry and Mechanicks, there being no perfect Congruity or  
“ exact smoothness in Nature, the manner of the Cohesion of Bo-  
“ dies, and the small proportion the solid Matter bears to the  
“ Vacuities in them, and the Nature of the constituent Particles  
“ of Bodies not admitting the same, besides how very imper-  
“ fect our most finished Mechanick Performances are, a very  
“ ordinary Microscop will easily discover: Now these things will  
“ very considerably diminish the Communicated Force: So that  
“ it is impossible there should be a perpetual Motion, unless the  
“ Communicated Force were so much greater than the Generat-  
“ ing Force, as to Recompence the Diminution made therein by  
“ all these Causes, and that the Impressed Motion may return to  
“ the first Mover undiminished; but that being contrary to this  
“ Law, it is clear the Motion must continually decrease, till at  
“ last it stop; and consequently, there can no perpetual Motion  
“ in the present State of Things.

For Answer, I acknowledge the Law, deny the Corolary; for I have it always in my view, that the perpetual Motion I intend, is an effect, proportional to the adequate Cause I assign, observing always the Proportions of Determination and Direction simple or compounded accordingly; I mean likewise an uninterrupted Communication of the same Degree of Motion, and more from one part of Matter in a Circle, as Bodies put in Motion, do for ever move in the same; the adequate Cause of the Motion, being still the same *durante materia*; if not greater, no less, causing a Circulation of the same quantity of Motion, and that Instantly and Perpetually returning undiminished on the first Mover, which the Air, Frictions of Matter, the roughness of Material Organs (the Machine being made according to the exactest Principles of Geometry and Mechanicks) the manner of the Cohesion of Bodies, the small Proportion the solid Matter bears to the Vacuities in them, the Nature of the Constituent Particles of Bodies, and all the diminution and hinderances alledged, shall not impede this Machine to Move perpetually, but according as Matter dissolves *pro toto*, or *tanto*: And all this according to the Law Second, which I grant.

Which I illustrate by this plain Simile, if I can Demonstrate the Possibility, Probability or Practicability of a Machine consisting of so many Wheels, without Springs, which are Impertinent Originals or Ingredients in a perpetual Movement, which shall perform what is done by a Watch, Knock or Milne, so long as the Tooth or Axes of the Wheels will last and serve for Communicating the Force of the first Mover, and return it undiminished on the first Mover again; which Motion should last always, if Matter were incorruptible, tho' the Air and all without it self were the same they are. To shun Logomachie, I intend no more, If the Corolary be to prove the Corruptibility of Matter; and by consequence, that such a Machine will Rest where Matter does not serve; I am of the same Judgement, for my part, I see no more strength in the Corolary. For,



I take it as granted, that Matter since it is not a self-Existent Being, has of it self no Inclination or Propensity to Motion greater or lesser, but according as it is Moved, and that it is Movable according to the Determinations, Directions and Inclinations of the first Mover; which Complex Hypothesis I lay down as the Original Principle and Fundamental of all my Thoughts about the Compositions, Continuations, Dissolutions and Renovations of Things, whereof I have any Idea or Apprehension; according to which, and my way of Thinking, I apprehend all *Phænomena's* may be Explained: Without which, contrary to which, beyond which, no agreeable Account can be given, or Adequate Cause assigned to such Events and Effects as we observe, whereof I my self am one, an Epitome and Compend of the whole.

The first Motion I apprehend is, That of Composition which we cannot comprehend, for we are sure Matter is Compounded, tho' the Manner of its Composition must be reckoned among the Incomprehensibles; or if not, let him, who can, tell us the Dimensions of the first Particle of Matter.

The second Motion is Continuation, which tho' we Apprehend, we as little Comprehend as we do its first Composition, how Matter is so Gloriously Diversified and Distinguished into so many Orbs of Composition and Continuation as the different Elements, Sun, Moon and Stars, Minerals, Vegetables, Sensibles, how they move in their proper Figures of Composition and Continuation, for whose different Durations, Magnitudes, Powers, Splendors, Soliditudes, Formes, Amabilities, Uses and Aptitudes, Active or Passive, why the various Orbs of the World swim so pleasantly into so rare a Fluid, notwithstanding that every part of them, according to Philosophy and Mathematicks, is of greater Specifick Intrinsic Gravity, without falling from their Centers, or going out of their curious Courses, are such wonderful Events and Effects as cannot be agreeably Explained by any special Science, Philosophy or Mathematicks, which must give the first

bow to Theology; and when they go Hand in Hand, adequate Causes are assigned for all Motions in their Compositions, Continuations, Dissolutions, Renovations, Determinations, Directions and Inclinations; and no other ways, according to my way of Thinking: And all according to the complex Hypothesis alledged.

The Third Motion is Dissolution, and the Fourth Renovation, which seem to be the Motions that fall most under our Cognizance; for the other Two we must believe and take as granted; and yet the Two last, are so fine and curious, that no created Thinking-Power can have an adequate Idea of the subtle Numerations, Additions, Subtractions, Divisions and Multiplications of Matter in their various Determinations, Directions and Inclinations, whereby it is dissolved by Friction, and redintegrate unto Orbs of Secondary Compositions and Continuations; for as we know not the first Particle in Composition or Continuation, so neither know we the last Particle in Dissolution, or the first Particle in Renovations, which is nothing but a second Composition, tho' not so Glorious as the first: And therefore we must rest satisfied with some certain Limited Course, rude Complex Ideas of Things, and believe the rest with the Theologue: And this I take & maintaine to be the Rate of all Human Understanding.

Which incomprehensible Motions of Dissolution and Renovation, notwithstanding of the Frictions of Matter moved, which are unintelligible without Opposition; yet we apprehend most surely, partly by Believing, partly by Understanding, partly by reflecting on what we are thus constrained to believe and understand, that we must acknowledge that these Changes and Chances are so far from hindering the Renovation of Things and their perpetual Motion, and returning of the Communicated Force to its first Original, whether we mean GOD the Author, or the *Primum Mobile* of Matter, that tho' we cannot comprehend how it is done, we apprehend surely it is done, which no Man can deny, and the less we comprehend it, the more

we



we apprehend it; the Circulation of the Elements is so Established by the Laws of GOD and Nature, that none of them Diminishes, but continues their Magnitudes, Powers, Colours, Soliditudes, Formes, Amabilities, Uses, Fittnesses, as of old, except in so far as they are changed by the Arbitrary Determinations, Directions and Inclinations of the first Mover alledged, who when he has Inclination to make any considerable Alteration, foretells his Projects to his Deputes Theologues, Philosophers or Mathematicians, and by by verifying them incontrollably, proves himself, to be what they believe him, the first Mover of Nature; especially since we never heard of one who ever Arrogated the Name of Self-existent, Immense, Omnipotent, Wise, True, Omniscient, Loving, Righteous and Free to himself; but One who Names Himself, *I am*; which Name is inconsistent with the Dissolutions and Renovations every Being else, save that One first Mover, is lyable to, according to our Apprehensions: Which Prerogative, is so Powerfully, Wisely and Lovingly Maintain'd in the Continuation, Dissolution and Renovation of Things according as Himself more immediately, or by his Servants more mediately, do foretell or Project, that its unconceivable how these Beings that are lyable to Dissolution and Renovation, can be Self-existents; it being unintelligible to us, that a Self-existent can be Dissolved or Renewed in any Degree, according to our way of Thinking, which is according to the Criterion of Verity, which I take to be thus:

Such an Hypothesis is true, according to which, every thing comes to pass, as they are fortold, and every thing done, as it is Projected, which would not come to pass, nor be done possibly or probably otherways, according to our way of Thinking; and therefore I believe the World is a *Perpetuum Mobile*, and GOD the Author; for I believe it, as I believe my own Existence, that He that is Master of one of these principal Motions, He is Lord of all, whatever Motion you condescend on, Ascending or Descending; and if any Being can give me a Demonstration of his

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Continuance, Dissolution or Renovation, I grant, He may defy my Hypothesis, I could easily believe He were not by Chance, but of Himself; for if I were but so Powerful I would Worship my self; much less, that base Original Matter, or Chance, whom by my Power I can Resist, and by my Wisdom treat like a Fool, Rejoice and Triumph over him, when I find him void of Glory or Perfection fit to subjugate mine: And all this according to the Original Hypothesis and Criterion of Verity.

### COROLARY.

*There is nothing in a Perpetuum Mobile against the Laws of GOD and Nature; but the One is the Adequate Cause, and the other a Proportional Effect.*

2do. For Frictions, I am not obliged to acknowledge them at all, for I deal in Points, Lines, Figurs, Surfices, which are not lyable to these Inconveniencies; I have ado with Mathematicians not Philisophs; but if my Thoughts be try'd in Matter, some Allowance will be granted out of the Advantage, the one side of the Ballance has over the other, the Machine being so ordered, that what Advantage is on one side in the first Position, is always so, as when a Wheel is moved about its Axis progressively on an Horizontal Plain, the motion never changes its Situation, so as to make any Alteration of Statical Power, because the Pressure is always upon the same simular Point of the Circle at the same distance from the Center of its Progressive Motion, and all that is required to move a Circle so; is any sensible Impresse, that is greater than a Mathematical Thought, or whatever more is requisite, if the more do not exhaust all the odds of Power that is on one side, what is remanent will suffice, because it is the same in all Positions on an Horizontal Circular plain; which being the same always, is the returning of the Force of the first Mover entire upon it self again.



All I have adoe, is to prove a Centripetal Preponderation progressive upon an Horizontal Line of Direction, which is not to be exhausted by going down, whereof the Idea, at least, is clear; because the *Primum Mobile*, as it is ordered, cannot go downward, but must imploy all its Centripetal Force in going forward upon an Circular Horizontal Plain, which has no end; so as the Case is the same, as if the Centripetal Determination and Direction were made Infinite for the Infinity of its Direction; there is no doubt, because it is an Horizontal Circle for the Infinity of the Determination; by which, I mean, its Intrinsic Gravity and Tendency toward the Center of its own Orb, that is Infinite likewise: for it will always incline downward with the same Propensity, and not suffered to go lower, if Matter did not fail, the Motion must be Infinite *durante materia*: All which, shall hereafter be explained, as if Matter were Impenetrable; which that I may do orderly,

1<sup>mo</sup>. I must explain my Terms. 2<sup>do</sup>. Condescend upon some Principles I think certain and agreeable to the former Hypothesis. 3<sup>io</sup>. Demonstrate my Complex Proposition Synthetically, which I do by Four Figures.

1<sup>mo</sup>. A Centripetal is, that we understand by the Gravity of Body, pressing it downwards towards the Center of its own Orb, arising from the External Impress of another Being than it self.

2<sup>do</sup>. A Centrifugal is the contrary Inclination Bodies we call light have of going from the Center of Motion, occasioned by the Prevalency of the Centripetal, to whose Force they must yeild and be gone.

That which is called Centrifugal, with respect to one Orb, is called Centripetal, with respect to another, and what goes from one Orb always flies to another; neither do I apprehend any middle Point, by which the Circumference of the Universe up or down, East or West, may be determined; and since I have no Comprehensive Idea of its Composition, I reckon the Center & Circumference amongst the Incomprehensibles, and a *Vacuum* to be

be *nec quid, nec quantum, nec quale, nec aliquid eorum quibus ens determinatur*; so as I have no Apprehension of it, I have much less Comprehension; I have an Idea of several Orbs, and the Centripetal Tendency of as much Matter as will make up these Orbs, which of the Orbs is the *Primum Mobile* that received first Impress from the great Mechanick, I believe whichsoever moved first moved the rest, and that the Motion of all is Simultaneous: In which Motions, since we observe them all to be, I think the Idea of the *Primum Mobile* of Nature is to be reckoned amongst the Incomprehensibles; and so I rest satisfied with the most probable Accounts, supposing that this knowledge is industriously deny'd us; that when we always observe such a curious Machine, for whose Motions no Man can give an Adequate Mechanical Reason, but he that is at once a Theologue, Philosopher and Mathematician; we might always enquire about the invisible Spring from whom the *Primum Mobile* of Matter, the Original *Medium* of material Motions received the first External Impress, which it instantly Communicates to the rest of the Orbs, and returns undiminished upon it self again, while the first Impress is not retracted by the Author and Creator of it.

According to which complex Science, *viz.* Theology, Philosophy, Mathematicks and Accounts given by the great Professors of it; if the World was in the first Appearance a Chaos, in the second the Elements began to separate by a Centripetal Pressure environing that thick Mass of Matter, which is expressed by the Spirit of GOD moving on the Face of the Deep, which occasioned the Centrifugal Inclination of the Elements to their respective Orbs and due Distances from the Centers and Circumferences of one another; at which due distance, when they come to an equal Poise amongst themselves, which is the only Measure of the due distance, when they Glomerate, the first Centripetal Tendency continuing always to be the same; these Orbs once so compleated, having no Inclination of their own to move, or be moved, remain in their own Station without any Propensity of de.



deserting it; and that quantity and kind of Matter which at the first was Determined, Directed and Inclined to fill up the Inter-medial Spaces betwixt these Orbs, serves as a Firmament, and Limits for their Separation, which is easie to be apprehended according to the General Theological, Philosophical and Mathematical Hypothesis, that Matter is not of it self, but receives from an other its Motion of Composition, Continuation, Dissolution and Renovation; according to which Supposition, since all Events do come to pass, and effects are done, which otherways cannot be reckoned for; this Theological, Philosophical and Mathematical Account of the Universe, must infallibly be true, according to our way of Thinking; with which therefore we rest satisfied, since we have no Measure to know what is without us, except the Thoughts and Ideas that are within us, to whose Force we must yield, and that proportionally to their Force and various Degrees of Direction; no Man daring to pretend to a higher Degree of certainty than a Subjective, for things are not so, because we apprehend them to be so; but they are so apprehended by us because they are so, for their Beings are not the consequence of our Thinkings, but our Thinkings the consequence of their Beings, only the first Mover has that Prerogative of thinking that, because he thinks the Thing it self is immediately according to his Fiat. For us, whither Things without us, be so or not; as we irresistably apprehend we must believe them to be so, and rest satisfied, and that proportionably to the Force of our Ideas about them.

According to which, in our course and rude way of Speaking and Thinking, I think that Orb that has most of Intrinsic Motion in it, the fittest *Medium* of Communicating what it has received most of, *viz.* Motion to the rest of the Orbs, and that is the Sun.

*3<sup>rd</sup>* A Circular single is a Motion of a Wheel about its own Axis Double its own Axis and another, whether that Motion be Progressive, Vertical like a Cart, going forward, or Horizontal on

its side; these are the four next rare Motions of the Orbs, the first is the easiest of all, except the Trochlea, which is a Motion of a Wheel about an Axis perpendicularly erected, which moves on a Point; whereas a Vertical Wheel is supported by, and moves on Two Lines, which I think, in part, was one Reason why *Archimedes* said, *Give me a fixed Point, and I remove the Globe;* for I suppose the Orbs of the Universe once made up in their respective Circumferences, movable about their Centers in these kind of Motions, but in no degree of actual Motion, except the Centripetal and Centrifugal, strictly speaking, the least Impression made from without, on one or all of these Globes, on one side more than the other, should move them all; according to the general Hypothesis, the least motion has influence on the Whole; because these being equally Poised, are so no longer, when there is a preponderating Force added to one side, which Force, will always keep them in Motion, because it meets with no Counterpoise to make Resistance in one part of the Circle more than another, since Matter of it self neither Contributes nor Resists, but is only a Passive Medium of Communicating the Force of the first Impression, returning it entire to the first Mover again; so that while the Impression of the first Mover is not retracted, they shall move always, as we observe them, and when retracted, return to these first Chaos until they be renewed; for I see no Reason for Annihilation, and as little Idea or Apprehension, much less Comprehension have I of it: And therefore I think, what was once well done, should rather appear in different Forms, than altogether disappear. But this Motion cannot flow from themselves, for set as many Globes as you can Number equally poised on their Axis, it is unconceivable they should move; else a Perpetual Motion might easily begin of its own accord, without an Extrinsic Author; and I am sure I know the contrar, and no Body doubts it, let *Archimedes* in Name of the Mathematicians, and *Aristotle* in Name of the Philosophers shew me another fixed Point, from which this External Impression should flow; but the God of the

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Christians, Theologues, Philosophers and Mathematicians, whose Attributes the Determinations, Directions and Inclinations of this great Machine shews, as a Stream directs to its Fountain, Events and Effects to their Natural adequate Causes.

If I saw the Orbs of the Universe confused in their Motions, such a sight would surprize me with disquieting Thoughts, why He that made them so Noble in their Compositions, would not direct and incline them better: Or if all these were of themselves, and I of them, I would Curse the State of the foolish gods, who by Chance made me Wise, and are not so themselves, but Blind, Dumb and Deaff; which inconsiderate Deed, merits no respect, there being no design in it, which only makes Actions Valuable, and desire the Being of a wise God to Govern them, and bless my own State more than my Originals, tho' I should Perish the next Moment for doing so; to which since I can have no Inclination, shunning the thoughts of Everlasting Death and Privation of Design, Conscience, Understanding and Pleasure, in which kind of Motions, I find my self with the Complex Determination, Direction and Inclination of my Nature; I am irresistably constrained to refuse the Idea of that Original, who never did, nor can design or continue, or renew these Motions in me, which I call my happiness; and to design and desire as much as I find in my Power, the Idea of such an Original adequate Cause and first Mover, as may continue and renew in me these pleasant Motions, which tho' I find in my self, are not of my self; and this Idea never satisfies me, if it contain not what I desiderate in my self, which is Self-existence, Greatness, Power, Wisdom, Splendor, Truth, Form, Omniscience, Love, Righteousness and Freedom: So that as by Participation of that Nature by way of Shaddowy resemblance, I find my self in a pleasant Complex Motion, fully and finally by immediate Union with him, when I who am the *Medium* of the Communicated Impress return the Communicated Force in the Continuation, Dissolution and Renovation of my Nature intire again upon Him, whose Image I

am, my Understanding and my Will forces me equally to acknowledge the Idea of such an Original as my first Mover: Which Glorious Idea, the Determinations, Directions and Inclinations of the Celestial Orbs, proves so irresistibly, that I cannot ascribe their regular Operations to any Being void of Design, more miserable than my self; and since I have not any Idea of an endless Series of Causes, I Believe, Hope and Desire the Being of a Great, Good and Wise GOD; as I do of my own Immortality, whose Idea, as it is Imprinted on me by these fore said Motions, so most of all, by the Cochleal.

The Cochleal Motion is the most Glorious, for it performs all in one, the Resemblance of it is a Screw single, which every Body knows double, which is the apparent Motion of the Sun; here the influence of the first Mover shines and glances; to see a Glob move about its own Axis, is not so wonderful, because easiest, tho' properly speaking, there can be no Wonder or Difficulty in any Effect or Event which flows from an Adequate Cause; and consequently, there can be no Object of Admiration but One, viz. the first Cause; the rest are only *Mediums* of Admiration, which according to their received Aptitudes Transmit, Reflect, Refract the Communicated Force, which flows from the first Original Mover, serve as Types to make the Impression of Admiration on us so Framed, but cannot Move of themselves without a Printer; and in the meantime, has as little Resemblance to the first Original Typograph or Idea produced in us, as the Letters *MAN* has to the Printer, or him whose Idea these Letters as *Mediums* Transmit to us; but comparing *Medium* with *Medium*, to see a Glob move about its own Axis in a Circular single, is not so Glorious as in a double, and to see it move in a Circular double, Progressive, Vertical or Horizontal, not so curious as the Cochleal.

This Motion the Sun apparently performs betwixt the Tropicks Screwwise, and when it returns, follows not the same Lines of Direction, but describes a Spiral Line crossing the other; which



which requires such exactness of Mechanical Direction, that such as are pulled with the fine Motions intended for an Artificial Movement, would assure themselves of the impossibility of this, if they did not see it; no wonder tho' Theology compares it to a Bridegroom rejoicing to run his Race, a Race indeed, wherein the Imaginary Stoups are the Tropicks which the Sun turns so cleverly, as not to go by them; for all the haste its in, seems to stand a little and pause, refreshing it self with the easie Motion of the former, and insensibly beginning his curious Course back again, accelerating and going on in a constant Pause, not wearying in the Repetition, which is so stupendous, that if there were no choice, but one; rather than believe this Man Bridegroom-like Creature, its Motion could be by chance, I would Maintain the Sun had Wisdom as it has Motion, and Heat: as if I saw an Artificial Movement of curious contrivance, rather than to believe it to be by chance; I would believe it Self-wise as some Ignorants, Children, Idiots and Atheists do, who Worship the Sun or any other part of the Machine, or the Machine it self, without paying due respect to the Author, for no other Reason, but that he is invisible, whom if they sought after, would believe as I do, that I who am a Machine my self as they are; as Wisdom lodges not in me which is the *Medium*, but in my Author; so it cannot lodge in any other *Medium*, whose Motions are Infinitely below mine, all of them being finer than those we observe in the Sun, or any other Orb, such as are my Sensations, Imaginations, Preceptions, sensible Reflections and Conscience; which last finishing Stroak, makes us differ from Brutes and all Material Movements, making us a Compend of the whole Universe, which are as far above the former Motions, as Thought transcends unthinking Beings; that when we consider them with all due respect and gradual Excellencies, we cannot find it in our Power to acknowledge an Original, that has none of these fine Motions in it, we have: And therefore seeking after an Adequate Cause of our fine Motions, we must at last finally resolve, that the Original

of Sight must See, of Hearing Hear, of Speaking Speak, and withal, be Conscious of all his Actions, as we find our selves to be. Which Conscience, since Material Beings without us, neither assert nor prove to us, but are silent and incogitant, if our Thoughts about them deceive us not, and if the Concealment of Thoughts be industrious, they are the greater Deceivers; which being the worst of Ideas, I cannot entertain them of my self, much less of my Original: So that finally, I rest satisfied, that God is the first Mover of me, and all Things else betwixt God and me the Mediums: And all this agreeable to the first Original Principal Hypothesis; the two last Motions is that of a Wedge and a Mell, which every Body knows.

I desire not to be thought Excentrick to my Design, for I speak like a Mechanick, and such as undertake the Explanation of the Motions of the Universe, which my Argument obliges me to, without having any Thought of, or enquiring after an Adequate Original of me, who am a little World, are like Men that see the Box that holds the Spring, and seeing it move, enquires no further, but takes it as granted, there is nothing but what they see, will not believe what they do not see or comprehend, nor satisfie themselves with fixt, clear and pleasant limited Apprehensions, which is the common Rate of Human Understanding, because they found it Moving when they came to the World, they see it Moving, they leave it Moving, so as their Principle will hold out their Time; and who can oppose them, for they are Learned Philosophers and Mathematicians, and none can give a better Account of the Operation of the Medial Wheels betwixt the Box and the Ballance back and fore than they; by whom he that all his time believes the Existence of the Spring, and admires its Elasticity, which gives such degrees of Motion and Life to the Wheels, which is the only Wonder of the Whole, is look'd on as a Fool, and cannot help himself in the present State while the Watch is going: I am fully perswaded, which is the highest degree of my certainty, being but a Subject, such Men are imperfect Mechanick Philosophers or Mathematicians, which



which is the Ruine of Men of Medial Learning who dote so much on what they see, do not believe nor enquire after him, who is the invisible Spring of all; who shall be seen visibly when the Box in which we Move shall be opened; the Machine dissolved according to the Mechanical Account Christian Philosophy, Theology and Mathematicks gives us of the Universe lesser, which is our selves, Greater which is the Material Frame about us, whereof, as I believe, the Author to be the same, as I believe my Composition; and therefore of my Continuation, and therefore Dissolution, and therefore Renovation, and therefore I believe with the same certainty, as I change my State, so the rest may change theirs, which is the returning of the Communicated Force upon the first Mover again; and as I find no Reason why the Material Movement may not continue its Perpetual Motion under different Phases, I much less see any, why my self may not continue my Motions for ever, according as I observe, or not observe the Lines of Direction, in which the Impress of the first Mover is Communicated to me; which if I observe the Communicated Force of my Nature returning intire undiminished upon the first Mover again, the same Motive that disposed the first Mover, first to Compound, then to Continue; thirdly, notwithstanding of the various Dissolutions, to renew the Orbs of the Material Movement, saving them from Anihilation, will with a Freedom proportionably to the Nobleness of my Composition and Continuation renew all my Noble Motions again, whereof Thinking being one, I shall Think and Live for ever, tho' in different degrees, according as I follow the Lines of Direction assigned me by my first Mover, or swerve from them; so that for the same Reasons that any thing else shall Move Perpetually, I may live for ever, which is the second Natural Demonstration of Perpetual Motion.

I admire *Archimedes* as a Mathematician, and *Aristotle* as a Philosopher, with relation to this Medial Knowledge, but their Mechanical Accounts of the Universe are Infinitely Lame; and such.

such are all Accounts of any thing that does not relate the Composition, Continuation, Dissolution and Renovation of that Being that's under Cognizeance; and I pity abominable Ignorants, such as exhaust their Spirits and their Time in gazing on some few Figures and Draughts, without having any serious Reflections on Nature in all its principal States first and last, also well as Medial.

2dly, I condescend upon some Principles agreeable to the former, by which I am to Demonstrate my intended Artificial Movement, being fully perswaded that no Theorist does Apprehend, far less Comprehend all the present and possible Conjunctions of Motion, or can determine what may be done by GOD the first Mover or his Mediums, or prove any Inconsistency betwixt the Natural and Artificial Mobiles, the Natural being the very Law of Natural Motions, and the Artificial the Conjunction of all Natural Motions in Imitation; and therefore general Arguments are not so Perswading for an Artificial one or against it, as a Special.

1mo. That there is no rest in the Universe, but pleasant and unpleasant Motion lesser or greater, which comparatively obtain the Name of Motion and Rest, for the rest of the first Mover is pleasant Action, Self-existent and Independent; of the second, Existent, Cogitant, Dependent; of the third, which is Matter, Existent, Moving, Incogitant, Dependent; for if the first Mover be in rest, all Motions must cease; if the second Mover rest, it looses the Impress of the first Mover, changes its Nature; if the Soul cease to Think for that Minute, it is no Soul, but Incogitant Matter, if Matter were in perfect rest; for so long it would be Incorruptible, Indivisible and Impenetrable, and all the Laws of Motion must cease; the firm Rock is always in a degree of Centripetal Motion, for the least Motion in the Universe has Influence on the Whole, either in Compounding, Continuing, Dissolving, Renewing, Accelerating, Retarding or Ballancing. 2do. That the World is a *Pexperuum Mobile*. 3tio. That whatever is in Nature



ture is imitable by Art, or whatever God does by Himself, He can do the like by a *Medium*. 4<sup>to</sup>. Every Body that acts on a Ray receives Power proportionally to the distance of the rectangular Pressure, from the fixt Point, of whatever Shape that Ray is.

5<sup>to</sup>. A Body leaning on two or more Centers, gravitates in a Reciprocal Proportion to the distance of that Body from these Centers, whether these Centers be fixed or movable.

6<sup>to</sup>. That in all Progressive Motions, Vertical or Horizontal, the Point of Contact is the Center, and the Point of Attraction the Extremity of the Ray, whether the Point of Attraction be the Center of the Circle, or any other Point at a definite distance from the Point of Contact; the distance whereof, from the Center of Motion or Point of Contact, is to be reckoned according to the fourth Proposition.

7<sup>mo</sup>. In all Circular Motions there is no part of a straight Line described, or Rectangular Pressure Communicate.

I divide the whole Proposition into Four Figures (1. Figure) supposing an Horizontal Circle 18 Foot in Diameter, *A, B, C, D.* fixed by a four square Frame, which needs not to be described, but supposed every way fitted for holding this Wheel fixed in an Horizontal Position; this Circle *A, B, C, D.* Toothed about in the Circumference, with Tooth standing straight up at equal Distances and Heights; in the Center of the Circle *O.* an Axis erected perpendicularly, whose ends move in the Zenith and Nadir of the Frame which holds the Circle *A, B, C, D.* so fixed and Horizontally situate.

2<sup>do</sup>. Suppose a Ray of 12 Foot, *E, F,* from whole broad-side a Ray is drawn at the distance of 3 Foot from *F,* towards the Right Hand, when you hold the Ray *E, F,* in your Left, cutting the Ray *E, F,* at Right Angles, extending it self to *G,* which is 3 Foot from the place of Intersection, making up the side of a Square, which is 3 Foot equal to the other side, which comes from *F.* to the common Point of Intersection; let this Complex

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Ray

Ray be perforate in the Point of Intersection, so as the Axis which for Brevities sake is represented by *O*. may go through that bore, and the Ray *E.O.F.E.O.G.* move pleasantly about the Axis *O*. as one continued firm Complex Ray, the distance betwixt *O*. and *F*. and *O*. and *G*. being equall, making the two sides of a Square, and the distance of *F*. from *O*. and *G*. from *O*. being to the distance betwixt *E*. and *O*. as one is to three.

I suppose a Wheel of Twelve Foot in Diameter, *H, I, K, L*, Toothed about in the Circumference with Tooth going through at Right Angles, at equal distances, like to the Tooth of the former Circle *A, B, C, D*, so as the greatness of the Tooth and the distances shall be equal in both Circles, and the Tooth going through the Wheel *H, I, K, L*, at Right Angles, shall appear by six Inches on every side. Take this Wheel *H, I, K, L*, and perforate the Center of it, and do the like to the Brachium *F, O*. at *F*. get an Axis, and fix one of the ends of it at the bore you have made at the Point *F*. so as 12 Inches may appear upward; take this Wheel *H, I, K, L*, and hold it in an Horizontal Position, so as the Center of it may be in a Perpendicular Line above the Point *F*. so as when you let it down, the Axis erected Perpendicularly upon the Point *F*. may pierce the Center of the Wheel *H, I, K, L*. about which Axis the Circle *H, I, K, L*. may move pleasantly. Above the top of this Axis arising from *F*. which goes through the Center of the Wheel *H, I, K, L*. Let there be a Plate of Iron indented, covering the middle of the Wheel *H, I, K, L*. on the upper-side, so as it may move about easily, and the Tooth of the Wheel *H, I, K, L*. on the lower-side may indent and engage with the Tooth of the Wheel *A, B, C, D*. where the Circumference of both Wheels *A, B, C, D*, and *H, I, K, L*, shall happen to touch, take the Ray *E.O.F.E.O.G.* at the Point *E*. if you move it from *C*. to *B*. or *C*. to *D*. it is the same same thing, the Wheel *H, I, K, L*. will perform a double Motion, Circular Single, Progressive, Horizontal of equal Velocity, with the Motion of the Point *E*. because the Curve Horizontal Lines are equal



equal, which are described on both sides of the common Center and Axis  $O$ . and the Spaces they run through are equal, which is the same.

So that let the Opposition which I call the Impediment, be apply'd to any Tooth of the Wheel  $H, I, K, L$ , you please to pitch on, and hold clost by that Tooth always, (supposing the Tooth to be  $H$ . when it is in Conjunction with  $A$ .) and be equal to the Moment which I call the first Mover, communicating its Impression on the Point  $E$ . which may be two Men of equal strength applying the same Force in opposition to one another, when the Point  $E$ . is in a Perpendicular Line above  $C$ . and  $H$ . in Conjunction with  $A$ . in the same time that  $E$ . moves through as many Points of the Circumference  $A, B, C, D$ . as will be equal to all the Points of the Circumference  $H, I, K, L$ . the Impediment whose Motion begins at  $A$ .  $H$ . which Points lye at an equal distance from the common Center and Axis  $O$ . as  $E$ . and  $C$ . does, shall at once move about the Circumference  $H, I, K, L$ . about the Centers  $F$ . &  $O$ ; and when this single Circular Motion of the Wheel  $H, I, K, L$ . is Finished in the same time the Impediment, whose Motion began at  $A$ . upon the Circumference of  $A, B, C, D$ . and at  $H$ . upon the Circumference of  $H, I, K, L$ . shall be found resting upon the Horizontal  $A, B, C, D$ . at as great a distance from  $A$ . as  $E$ . is from  $C$ . and so in *infinitum*, with this difference, that  $E$ . is always of greater Power than  $H$ . in different Proportions of Excess, the Impediment having least Power at  $A$ . when  $H$ . is in Conjunction with it, and most Power at  $K$ . or whatever Point of the Wheel  $H, I, K, L$ . shall happen to be Diametrically opposite to the Point of Contact, where the Wheel  $H, I, K, L$ . touches the Circumference  $A, B, C, D$ . in its Circular Progressive Motion; which Point of greatest Advantage to the Impediment is  $K$ . in the first Position, in which Point and Position it doubles its Power on the Point  $F$ . whereas the Moment only triples, and in the rest of the Points the Moment increases, and the Impediment decreases proportionably to the distance of the Impediment and

its Rectanglar Pressure from the Center of the Progressive Motion in its first or second Positions; so that the Velocity of the Moment and Impediment are equal on both sides of the Common Center and Axis, and their Powers unequal according to the Fourth, Fifth & Sixth Propositions, which was to be Demonstrated.

### COROLLARY.

‘ When the Moment and Impediment are equal, and their Velocities equal, if their Powers be unequal; the Motion follows:  
 ‘ A degree of Moment and Velocity are not reciprocally equal, since their Powers may be unequal, tho’ the Moment and Impediment and their Velocities are equal, as in this Case; and yet Motion follows because their Powers are unequal.

This Proposition I reckon to be of the greatest certainty; and if it be not repelled, I may say I have done something, laid a Foundation, which others may Improve better than I, and perhaps not; but still I am willing to receive Assistance from any Man that offers Rationally for the Improvements I have made on this Fond.

(Figure 2.) Suppose a Wheel *M. N. P. Q.* Six Foot in Diameter, Toothed about in the Circumference, with Tooth indented like Rays coming from the Center; of the same greatness and distance from others, as the Tooth of the rest of the Circles *A. B. C. D. H. I. K. L.* place this Wheel Horizontally, so that the Tooth *Q.* may indent with the Tooth *L.* and the Tooth *N.* may reach to the Center *F.* and the Tooth *P.* lean upon the Point *G.* where it may have a small Wheel with Tooth divided about like a Roller for facilitating its Motion when the Ray *E. O. F. E. O. G.* is moved by an Impress made on *E.* this Wheel *M. N. P. Q.* leaning on the Points *L.* and *G.* is carried about, in a Double Motion about its own Center *R:* and *O.* the common Center, with the same Force, as if the Center *R.* received its Impress immediately from the Point *F.* and *G.* which is of the same Power with *F.* because at the Point *G.* and *L.* where the Impress is communicated to the Circle *M. N. P. Q.* the Impress is the same  
 in



in *L. Q. P. G. R. F.* as if all these Points were one with *F.* for they are of the same Power, tho' not distance, according to the Fourth, Fifth, Sixth and Seventh Propositions. (Figure 3.) Suppose a Ray drawn from *R* to *O.* and continued from *O.* to the Circumference *A. B. C. D.* to the Point *S.* which is Three Foot from *C. E.* when you stand at *E. C.* This Ray perforate at *O.* so as the Axis *O.* may go through it pleasantly, about which Axis *O.* it may move about freely the two ends of the Complex Ballance *H. I. K. L. M. N. P. Q. E. O. F. E. O. G. S. O. R.*, being Industriously turned about to one side of the common Center and Axis *O.* these two Rays *S. O. R.* & *E. O. F. E. O. G.* being so Situate, the Points *F. R. L. G. Q. P.* and their Rays being equal in power, according to the Second Figure, an equal Impress made on the Ray *E. O. F. E. O. G.* at *E.* with a Determination to the Right Hand, will prevail on an equal Impress made on the Ray *S. O. R.* at *S.* with a Determination to the Left; because the Impress made at *E.* communicates its Force in a triple Proportion of Power, which is communicated entire from *F.* and *G.* to *A. H.* from *A. H.* to *L. Q.* from *G.* to *P.* at the same time to *R.* and from *R.* to *O.* from *O.* to *S.* whereas the Impress made at *S.* in its Reaction or Opposition, communicates only a double Proportion, or near by, to the Point *R.* which returns the same Proportion to *P. G. L. Q.* to the Points *A. H.* which returns it entire to the Points *F. G.* which returns it the same to *O.* and *O.* to *E. C.* which Proportions being unequal, the Moment prevails over the Impediment, notwithstanding the Velocities be the same, conform to the Fourth, Fifth, Sixth and Seventh Propositions, First, Second and Third Figures.

(Figure 4.) Suppose upon the ends of these two Rays or Brachiums *E. O. F. E. O. G.* and *S. O. R.* two Vertical Wheels apply'd at the Points *E.* and *S.* like Cart Wheels on their Axes, cutting these Rays at Right Angles, both of the Verticals equal in Diameter, viz. Two Foot and Four Inches toothed about in their Circumferences, like *M. N. P. Q.* whose Centers are perforate as the Centers of *H. I.*

( 30 )

*K. L. & M. N. P. Q. R.* the ends of the two Rays *E. O. F. E. O. G.* & *S. O. R.* being rounded and smoothed, so as they enter into the Centers of both the Verticals *T. V. X. Y.* which is apply'd to the Ray *E. O. F. E. O. G.* at *E.* and 1, 2, 3, 4. which is apply'd to the Ray *S. O. R.* at *S.* about which brachiums they may move pleasantly, being so raised above the Horizontal Circle *A. B. C. D.* that the Tooth *X.* pleasantly indents with the Tooth *C.* and the Tooth 3. with the Tooth *S.* upon the Horizontal Circle *A. B. C. D.* whatever Impress is made on any of these Verticals, except in the Perpendicular Lines *T. X.* and 1. 3. the Rays *E. O. F. E. O. G.* and *S. O. R.* suffer that Impress proportionally, conform to the Fourth, Fifth and Sixth Propositions. If the Impress be made on the Points *T.* and 2. or 4. and *W.* then it is the same as if a Preponderation progressive upon an Horizontal Line of Direction were added to the Points *C. E.* and *S. S.* for the Centripetal Force that's added to *T.* will produce a Circular progressive of this Vertical *T. W. X. Y.* which communicates its Force entire from *T* to *C.* from *C.* to *E.* from *E.* to *O.* from *O.* to *F. G.* in a triple Proportion from *F* and *G.* to *H* and *A, L, Q. P,* to *R.* which are Points of the same power with *F* and *G.* whereas the Impress made at 2. communicates its Force entire to the Point *S, S.* from the Point *S, S.* to *O.* from the Point *O.* to *R.* in a double Proportion, or near by; which double Proportion of the Impediment meeting with the Triple Proportion of the Moment in the Point *R, F, G, P, L, Q, A, H,* and these Points being of the same Power, the Centripetal Motion of the Impress made on the Point *T.* is to the Centripetal Motion and Impress made at 2. as a Triple Proportion is to a Double, or Three to Two; which Centripetal Generating Force produces a Centrifugal greater than the Generating Force is, according to the Fourth, Fifth, Sixth and Seventh Propositions, 1, 2 3 4, Figures.

Suppose a Globe 5, 6, 7, 8. of such a Diameter as may reach betwixt the Points *T.* and 2, Toothed about in its Æquator like the rest of the Circles *M, N, P, Q. T; V, X, Y.* 1, 2, 3, 4. with



with two Ledges like the lesser Wheel of an ordinary Miln, so as the Tooth of it may indent easily with the Tooth of the two Verticals, and hold close by their edges in its Motion; this Globe being of that Weight or Centripetal Tendency, that the half of its Force shall be able to make a sensible Impression on the side of the Vertical that lyes next to the sides of its self, so placed besides the Production of a Motion in the Wheels, since it is equally poised betwixt these two Verticals T, U, X, Y. and 1, 2, 3, 4, and since the Centrifugal Pressure is greater at the Point 2, then the Centripetal is at T. consequently this Globe being equally poised of it self, must descend to the side where the Centripetal is of most Power, and meets with least Resistance: and ascend where it is of least Power, and meets with greatest Resistance; which it cannot do without rolling about its own Center, and at once causing a Circumrotation of the Verticals about their Centers and Axis, which produces a Motion of the Rays E, O, F, E, O, G, and S, O, R. which being unequally communicate to the Points F, G, L, Q, P. in unequal Proportions, in Lines of Infinite Determination and Direction; this Complex Motion once begun, must always continue while Matter lasts; because in all Imaginable Positions of its regular Motion, the Reasons of Motion are the same, which in one knot of Motion resembles all the Motions in the Universe, and that according to the Fourth, Fifth, Sixth and Seventh Propositions, 1, 2, 3, 4, Figures. *Quod erat demonstrandum.*

This much I have Communicated freely relating to my Design: I confess I have Industriously concealed also fine Thoughts as I have discovered; so as no Man needs trouble himself with the Experiment without them, tho' this may suffice for a Demonstration: All which Improvements are in the Model, which I will freely unfold to any Society that will generously Encourage me, and Demonstrate them as I have done the rest, whereby my Design shall be made Infinitely more easie: In fine, rather than to conceal an useful Thought of this Importance if I have it, I have ordered the Model so, that what I can do, may be done  
by

by a Mechanical Genius, by taking it down, considering the Connection, especially the due Proportions, and making another in fitter Materials, fine Brass and Steel accordingly, I suppose, as well without me, as with me, an Hundred Years hence, for the Model may last so long, and while it lasts, will serve for Direction; But if any Man will alledge the Natural Parent to be the best Nurse of its own Child; I offer my Service kindly: I have likewise another Scheme in Fluids, and a New Circular Pump of great Use; which, since I have not Abilities to finish, I have in all Humility Addressed the *Royal Society at London*, hoping to find them to be, what I believe they are, the greatest Encouragers of all Arts and Sciences; I would not use this Freedom if I suspected my Thoughts might be repelled without a Trial; and it is impossible for me to justify my self in absence, as if I were present: I hope no Man will take advantage of a Letter, or a Word; if any Oppose me, let him shun Logomachy, Idle Jests, Banters, or Malicious Satyrs and General Arguments; for the same degree of Self-denyal which disposed me to make this Appeal and Address, shall prevail with me for ever to yield to Men of better Judgment.

**F I N I S.**







FIG A J

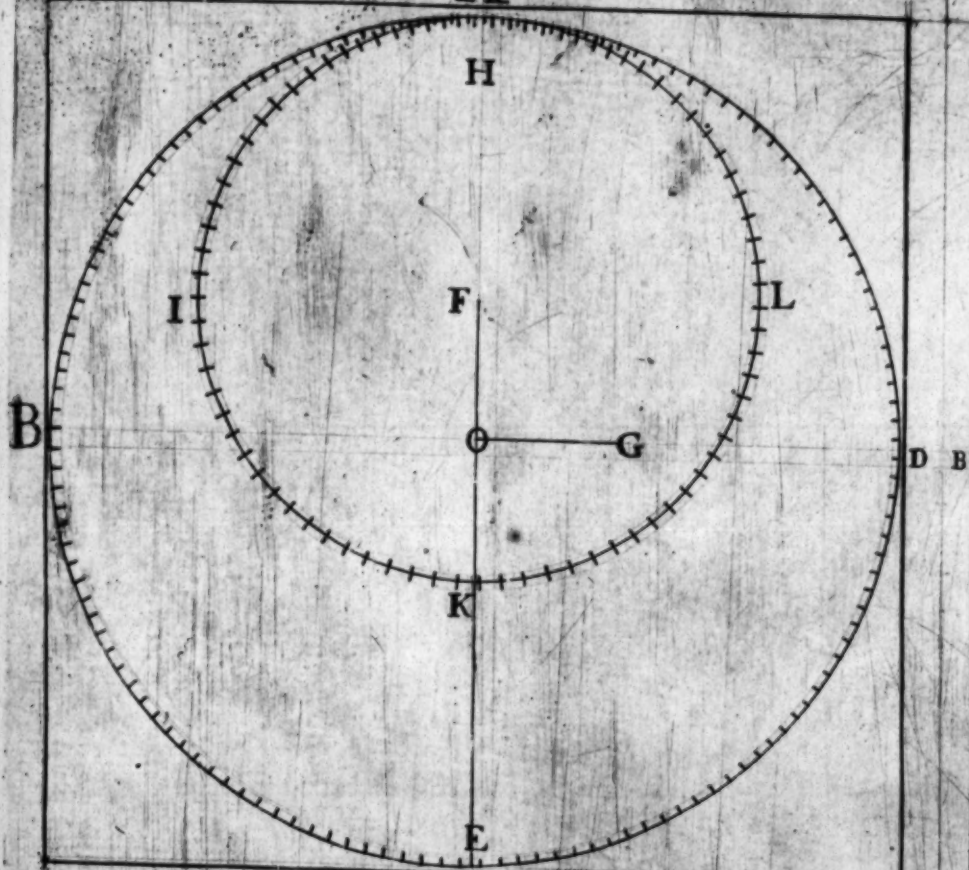
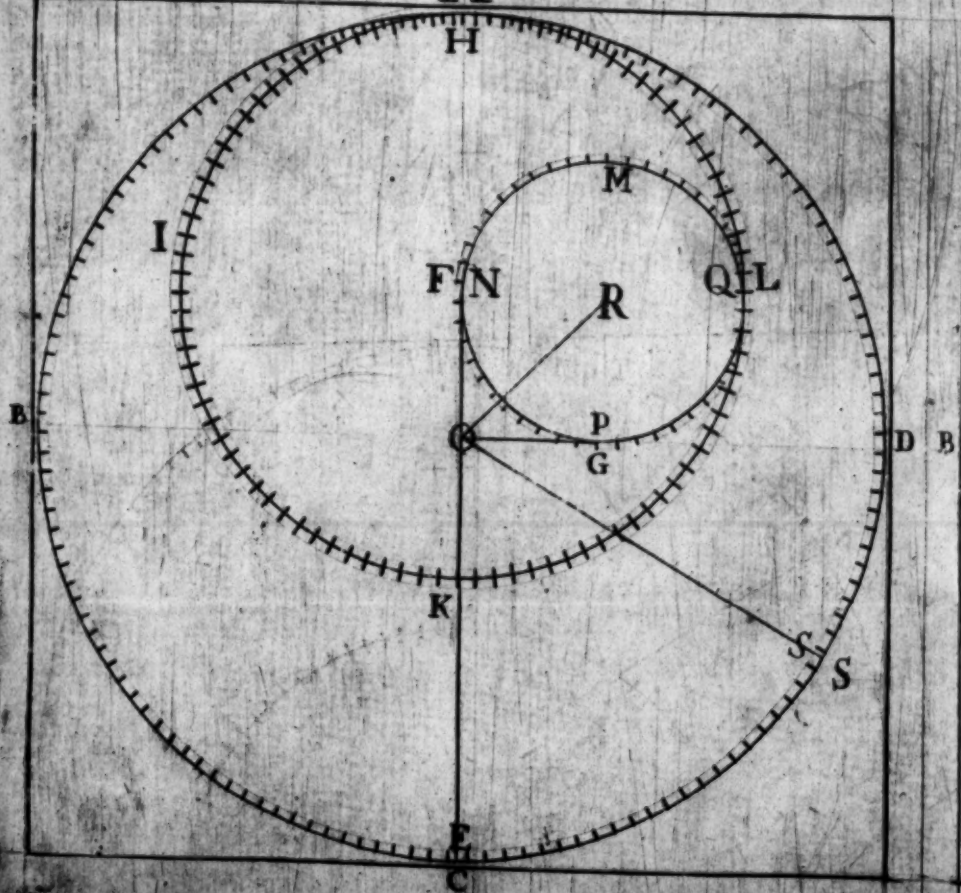


FIG A 3

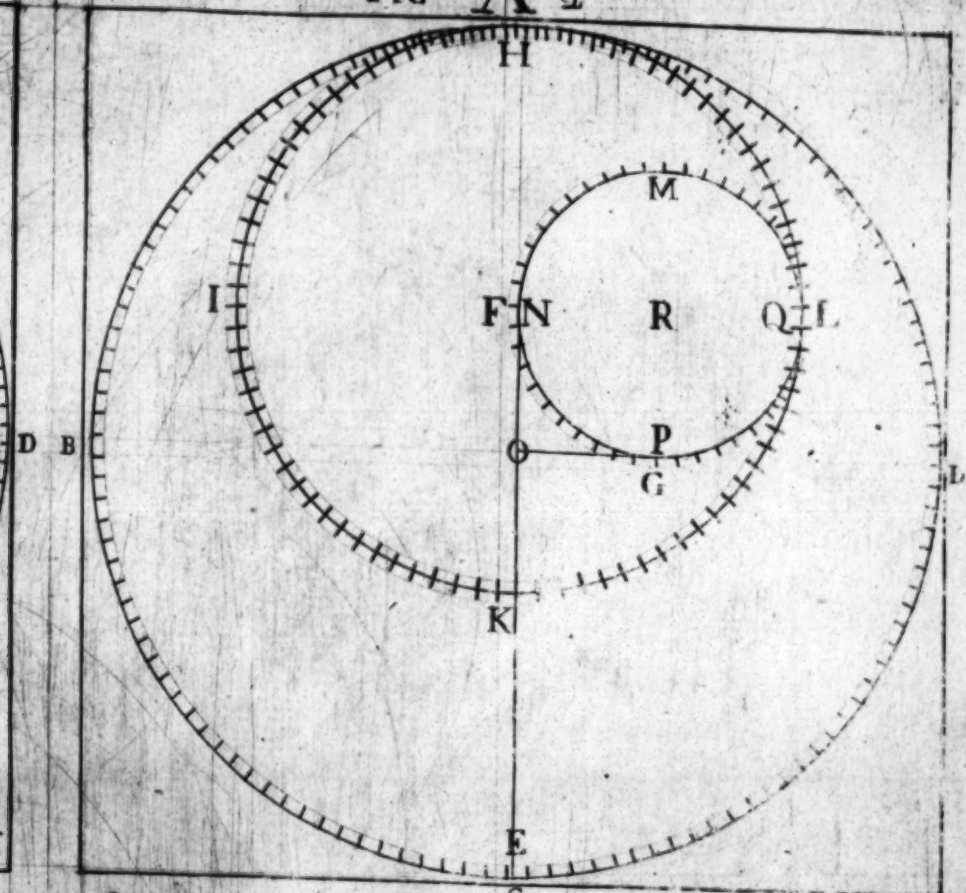
AR<sup>D</sup> BURDEN





FIG

A 2



FIG

A 4

